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~~CLAIMS~~

1. (Amended) An osteoclastogenesis inhibitory factor protein comprising the following properties:
  - (a) molecular weights as determined by SDS-polyacrylamide gel electrophoresis (SDS-PAGE) of approximately 60 kD under reducing conditions, and approximately 60 kD (a monomer) and 120 kD (a homodimer) under non-reducing conditions;
  - (b) high affinity to cation-exchange resins and heparin [derivatized substrates derivatives];
  - (c) [inhibition activity: inhibits] inhibitory activity for osteoclast differentiation [or] maturation, wherein [the inhibition] said activity is decreased by heating said protein at about 70°C for about 10 min. or at about 56°C for about 30 min., and wherein said activity is lost by heating at about 90°C for about 10 min.; and
  - (d) an internal amino acid [sequences substantially in accordance with Seq. ID Nos. 1, 2 and 3] sequence as provided in SEQ. ID Nos., 1, 3 or 3.
2. (Amended) The protein of claim 1 comprising the N-terminal amino acid [sequences] sequence provided in Seq. ID No. 7.
- 3 The protein of claim 1 which is derived from human fibroblasts.
4. (Amended) A method of producing an osteoclastogenesis inhibitory factor protein comprising the steps of:
  - (a) cultivating human fibroblast cells;
  - (b) [forming a lysate] producing conditioned medium of said fibroblast cells; and

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  - (b) high affinity to cation-exchange resins and heparin [derivatized substrates] derivatives;
  - (c) [inhibition activity: inhibits] inhibitory activity for osteoclast differentiation [or] maturation, wherein [the inhibition] said activity is decreased by heating said protein at about 70°C for about 10 min. or at about 56°C for about 30 min., and wherein said activity is lost by heating at about 90°C for about 10 min.; and
  - (d) an internal amino acid [sequences substantially in accordance with Seq. ID Nos. 1, 2 and 3] sequence as provided in SEQ. ID Nos., 1, 3 or 3.
2. (Amended) The protein of claim 1 comprising the N-terminal amino acid [sequences] sequence provided in Seq. ID No. 7.
- 3 The protein of claim 1 which is derived from human fibroblasts.
4. (Amended) A method of producing an osteoclastogenesis inhibitory factor protein comprising the steps of:
  - (a) cultivating human fibroblast cells;
  - (b) [forming a lysate] producing conditioned medium of said fibroblast cells; and

(c) [separating] isolating said factor from said fibroblast cell [lysate] conditioned medium by a combination of ion-exchange, affinity, and reverse phase chromatography, wherein said factor comprises an internal amino acid sequence as provided in SEQ. ID Nos. 1, 2 or 3.

5. The method of claim 4 further comprising the step of cultivating the human fibroblasts on alumina ceramic pieces.
6. A protein comprising an amino acid sequence as provided in Seq. ID No. 4.
7. Cancel.
8. Cancel.
9. Cancel.
10. (Amended) A protein expressed from a cDNA encoding an amino acid sequence as provided in Seq. ID No. 4.
11. (Amended) A protein having a biological activity [to inhibit] for inhibiting osteoclast differentiation [or] and/or maturation, said protein having an amino acid sequence expressed from a cDNA sharing at least about 80% sequence identity with the amino acid sequence provided in Seq. ID No. 4.

12. (Amended) A recombinant protein which inhibits osteoclast differentiation [or] and/or maturation, expressed from a cDNA encoding an amino acid sequence as provided in Seq. ID No. 4[;], said protein comprising the following properties:
  - (a) molecular weights as determined by SDS-polyacrylamide gel electrophoresis (SDS-PAGE) of approximately 60 kD under reducing conditions, and approximately 60 kD (a monomer) and 120 kD (a homodimer) under non-reducing conditions;
  - (b) high affinity to cation-exchange resins and heparin derivatized substrates;
  - (c) inhibitory activity[: inhibits] for osteoclast differentiation [or] and/or maturation, wherein said activity is decreased by heating said protein at about 70°C for about 10 min. or at about 56°C for about 30 min., and wherein said activity is lost by heating at about 90°C for about 10 min; and
  - (d) an internal amino acid sequence as provided in Seq. ID [Nos. 1-3] No. 1, 2 or 3.
13. The protein of claim 10 produced by gene engineering using mammalian cells as host cells.
14. The protein of claim 13 wherein said mammalian cells are 293/EBNA cells or CHO cells.
15. Cancel.
16. A protein encoded by a cDNA having a nucleotide sequence as provided in Seq. ID No. 8.
17. Cancel.

18. Cancel.

19. A protein encoded by a cDNA comprising a nucleotide sequence as provided in Seq. ID No. 10.

20. Cancel.

21. Cancel.

22. A protein encoded by a cDNA having a nucleotide sequence as provided in Seq. ID No. 12.

23. Cancel.

24. Cancel.

25. A protein encoded by a cDNA having a nucleotide sequence as provided in Seq. ID No. 14.

26. Cancel.

27. Cancel.

28. Cancel.

29. Cancel.

30. Cancel.

31. Cancel.